B) Amendment to the Specification:

page 1 ll. 5-11

The present invention is related to an ellipsometer and alignment method for the incident angle of the ellipsometer, and particularly to an ellipsometer which is capable of performing three steps and one corrective sub step and precisely and repeatedly measuring surface characteristic of a specimen by scanning the surface ~~with~~ by varying the incident angles of the light to the specimen and detecting the reflecting light from the specimen, and precision auto alignment method for incident angle of the ellipsometer.

page 2 para 4

However, the incident angle is altered by the misalignments of the components as well as the specimen stage. Namely, according to the state of the specimen stage 4 and the position of the specimen 4a on the specimen stage 4, there are h translation error and α tilt angle error and β tilt angle error. The h translation error ~~is occurred by~~ occurs ~~the specimen stage 4~~ when ~~the~~ components~~,~~ such as the polarizing prism and the light source, ~~etc.~~ are set and the α tilt angle error and β tilt angle error rise, ie, ~~between the specimen and the incident light thereon~~ when a new specimen is put on the specimen stage. The α and β tilt angle errors and the h translation error of the specimen stage may arise because the dimension of the present specimen may differ from the previous.

page 3 para 1

When a specimen, for example SiO_2 (of 100 nm) Si, is on the specimen stage 4 and the incident angle of the light onto the specimen 4a is 70 , the α and β tilt angle errors and translation error ~~are occurred~~ occurs in the process for the measurements of the specimen and their quantities are as below.

page 3 ll. 10-18

When the analyzer prism is misaligned by 3 tilt angle error and rotates for measurement, the spot also rotates and is partially blocked by the detector's entrance aperture. The trajectory of the spot when the analyzer prism rotates is shown in Figure 3, which was embodied in a Cartesian coordinate system from the electrical signals converted from the detecting light. The light is totally ~~transmitted~~ received or partially ~~transmitted~~ received from the detector's entrance aperture. Here, the dashed circle, G1, is a trajectory of the detector's entrance aperture, G2 is the trajectory of the spots and G3 is a trajectory of moving the center of the focus according to the rotation of the detector.

page 3 para 4

Figure 4 shows graphs ~~that~~ where the detector converts the reflected signal into an electrical signal ~~in a display~~ when the analyzer prism is misaligned. Here, G4 is a trajectory drawn by the detected signal at the detector when the components are misaligned, G5 is a trajectory drawn by the detected signal when the components 25 are perfectly aligned, and G6 is a trajectory drawn by a fraction of light which ~~is~~ has arrived

at the detector through the entrance aperture. Here, ~~1 value~~ a value of 1 for the fraction of light at the axis of the normalized signal magnitude indicates that the spot ~~is~~ has totally arrived at detector through the entrance aperture, provided that the detector is not saturated. Thus, the signal of the detector is the product of the intensity and the fraction of light.

page 4 para 1

Meanwhile, the orientation angle error of analyzer is ~~3~~, 3 the film thickness is calculated as 95.31m nm, that is a 4.79 nm thickness error. In this case, the alignment precision depends on the precision of manufacture and assemblage.

page 4 ll. 18

The measurement error was proportional to both β tilt angle error and h translation error.

page 5 ll. 1-4

Also, it is difficult to ~~manipulate the system~~ compensate for the misalignment of incident angle, thereby it may not ~~preferably~~ accurately analyze the surface characteristic of a specimen and not provide the complete information obtained therefrom either.

page 5 ll. 10-12

The main object of the present invention is to provide an ellipsometer which is capable of supplying ~~a~~ various incident angles of light onto a specimen and easily aligning the incident angles of light using kinematic coupling.

page 5 ll. 17-20

~~The~~ Still another object of the present invention is to provide a 3 step auto-alignment algorithm for supplying ~~a~~ various incident angles of light onto a specimen and easily aligning the incident angles of light using a 3 axis specimen stage and a detector outputting a signal.

page 5 para 5

In order to achieve the object of the present invention, there is provided an ellipsometer for aligning incident angle, wherein the ellipsometer ~~comprising~~ comprises: a main frame shaping half circle and flat surface on which a plurality of grooves are radial and circumferential directionally carved; a specimen stage, which is installed at the groove ~~caved~~ carved surface of the main frame~~,~~ for tilting a specimen on ~~a~~ an upper surface of the specimen stage with respect to horizontal direction and translating the specimen upward and downward; a polarizing unit, which is ~~capable of fixing and moving~~ movably positioned on the groove-carved surface of the main frame~~,~~ for polarizing a light from a light source and outputting the polarized light ~~to~~ on the specimen, ~~and moving on the groove carved surface~~; and a light detecting unit, which is

~~capable of fixing and moving~~ movably positioned on the groove-carved surface~~, for a reflection~~ to receive light reflected from the specimen.

page 6 para 1

In order to achieve the object of the present invention, ~~there is provided~~ a precision auto alignment method ~~for~~ is provided to align the incident angle of an ellipsometer, wherein the precision auto alignment method ~~comprising~~ comprises the steps of: measuring tilt and translating angle errors according to incident angles of a polarizing unit; compensating each error by moving a light spot reflecting from the specimen onto a center of the detector's entrance aperture; calculating the tilt and translating angle errors ~~from~~ by repeatedly performing the measuring and compensating steps above; and correctly aligning incident angle for the ellipsometer by adjusting the tilt and translating angles ~~errors~~ accordingly.

page 6 line 20-21

Figure 4 shows graphs ~~that~~ where the detector repeatedly converts the reflected signal into an electrical signal in a display when analyzer prism is misaligned;

page 6 line 22-23

Figure 5 shows a measurement error of the film thickness with tilt angle error of specimen stage, which is the same as the β tilt angle error;

page 8 line 6

Figure 7~~A~~ shows an ellipsometer according to the present invention

page 8 last sentence

Also, the positions and the shape of the grooves 17 and 18 must be accurately formed on the main frame 16, because the components outputting the light to the specimen and receiving the ~~reflection~~ reflected light from the specimen are fixed or moved ~~as they carved~~ according to said positions and shapes.

page 9 first sentence

~~Especially~~ Additionally, the material of the main frame includes ferrite components so that a magnet can attach thereon.

page 9 line 12-16

The balls 31 and ~~33~~ 32 are on the grooves 17 so that the polarizing unit 12 is easily align to the direction of the center of the main frame 16 or the specimen 10 on the specimen stage 11. The ball 33 is on the groove 18 so that the polarizing unit 12 is easily moved to the next groove 17.

page 9 line 18-20

They are positioned to be symmetric with respect to the vertical center axis 15, thereby the incident angle and the reflection angle are the same ~~each other~~.

page 9 line 21-24

The ellipsometer in accordance with the present invention mentioned above uses a 3 axis specimen stage and a signal ~~of~~ detector~~, and~~ that analyzes a surface characteristic of a specimen using a 3 step algorithm and one sub corrective algorithm as below:

page 10 line 14-18

We call this ~~as~~ an accessing process that has not been dealt with previously. In this process only two tilting motions are used without translational motion along the z axis. Figures 9 A and B show the accessing trajectory (dashed line) of the reflected light spot in a spiral form of increasing radius. ~~Not miss the~~ In order for the light to enter the detector's entrance aperture we had to carefully choose the parameters of the spiral.

page 11 line 3-6

Once the detector finds any light signal, this accessing process stops, and the centering process shown in Figure 10 starts. (Note that a new coordinate X ~~Z~~ Y in Figure 10 is that at the detector's aperture, which is different from x y z at the specimen surface in Figure. 2.)

page 11 line 14-16

By changing β tilt angle we can move the light spot until its intensity signal passes the maximum (Imax) value, reaching the half of the maximum (Imax/2) where the position of light spot is X_1.

page 12 line 1-3

For the ~~Z~~ Y direction, we repeat the same procedure by changing α tilt angle about x axis this time, finishing the centering process.

page 12 line 19-20

Therefore, two incident angles different from each other must be used ~~for~~ to correct incident angle.

page 14 line 1-2

where h is the translation error of specimen stage, and p is the distance between the specimen and the detector's entrance aperture.

page 14 line 15

where β_2 is the second tilt angle error of specimen stage.

page 15 line 6-7

Since thickness of specimens varies in everyday experiment, absolute β_1 value obtained by the first step is not meaningful.

page 15 line 11-14

Thus, β_2 can be expressed by β_1, which means that h+ δ_2 in Eq. (8) can also be expressed by only β_1. Since both the δ_1, and the β_2 can be expressed by β_1, we can get the two unknown errors of h and β_1, from two equations of Eq. (5) and Eq. (8).

page 15 line 17-22

In order to easily understand the operation of the ellipsometer according to the present invention, we will explain it ~~as~~ below. In the experiment, the specification of the components is that; the light source is HeNe laser of 2 mW; the linear polarizing prism is a calcite (Glan Thompson) polarizer with an extinction ratio $<10^{-5}$ and ordinary refractive index 1.655; the linear polarizing prism is rotated by a hollow shaft step motor;

page 16 line 8-10

As shown in the drawing, the spot was started from the left below side of the detector's entrance aperture and accessed spirally and centered on the detector's aperture.

page 16 line 25

As shown in the drawing, the spot was started from ~~the~~

page 17 line 6-8

~~On~~ At the end of the second step, the alpha tilt angle error and translation error was unchanged, and the beta tilt angle error was changed but not zero as shown in Figures 16B and 16D.

page 17 line 18-19

Figures 19A to 19D show each error and signal of detector when the ellipsometer aligns the incident angle thereof according to the present invention.

page 18 line 12-13

Accordingly, a 3-step auto alignment algorithm can align the incident angle of an ellipsometer using three steps and a corrective sub step.

page 18 line 14-17

The present invention has been embodied to an ellipsometer and a precision auto alignment method for incident angle of the ellipsometer though, it is easily appreciated that ~~a~~ many of other alignment apparatus such as a lithograph can be modified from the present invention.